

PATENT

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**ABSTRACT OF THE DISCLOSURE**

Embodiments of the invention generally provide an apparatus and method for replenishing organic molecules in an electroplating bath. The replenishment process of the present invention may occur on a real-time basis, and therefore, the concentration of organics minimally varies from desired concentration levels. The replenishment method generally includes conducting pre-processing depletion measurements in order to determine organic depletion rates per current density applied in the electroplating system. Once the organic depletion rates per current density are determined, these depletion rates may be applied to an electroplating processing recipe to calculate the volume of organic depletion per recipe step. The calculated volume of organic depletion per recipe step may then be used to determine the volume of organic molecule replenishment per unit of time that is required per recipe step in order to maintain a desired concentration of organics in the plating solution. The calculated replenishment volume may then be added to the processing recipe so that the replenishment process may occur at real-time during processing periods. The apparatus generally includes a selectively actuated valve in communication with a fluid delivery line, wherein the valve is configured to fluidly isolate a plating cell during a non-processing time period. The valve may be controlled by a system controller, and thus, the fluid level in the cell may be controlled during a non-processing time period.